

REMARKS

Claims 1-24 are all the claims presently pending in the application. Claims 1-2, 5, 7-8, 10, 12, and 20-24 are amended to more clearly define the invention. Claims 1, 10, 12, 14-17, and 24 are independent.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicant also notes that, notwithstanding any claim amendments herein or later during prosecution, Applicant's intent is to encompass equivalents of all claim elements.

Claims 1-2, 6, 10, 12, 16-17, and 24 stand rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 1, 4, 8-9, 11, 18, and 20 of U.S. Patent No. 6,529,977. Claims 21-23 stand rejected under 35 U.S.C. §112, second paragraph as allegedly being indefinite. Claims 14-15 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by the Bastiani et al. reference.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

An exemplary embodiment of the claimed invention, as defined by independent claim 14, is directed to a communication method for a network node attached to a serial bus.
the method includes setting a state machine in a receive mode, exchanging signals between the network node and a remote node attached to a distant end of the bus and determining therefrom a

turnaround time between the nodes, and setting the state machine in an idle mode for an interval beginning with an end timing of a packet transmitted from the node to the bus until the interval corresponds to the turnaround time.

Conventional parent/child networks, such as IEEE-1394 standard networks, an example of which is shown in Fig. 4A - 4D, have certain difficulties. These difficulties may primarily be due to a communication length which is longer than 4.5 meters which may require the use of 8B/10B block codes. For example, as shown in Fig. 5A, as long as the length of the Data Prefix D4 is greater than the turnaround time, then contention is prevented between the packet P5 and the Grant signal G3. Further, in order for a packet from the root node 2 to be transmitted without encountering the Request signal R2, it is necessary that the length of the Data Prefix D3 is greater than the turnaround time between nodes 2 and 3.

One of the problems for these conventional networks is the likelihood of a situation in which a Request signal remains asserted (i.e. is not canceled) in a longer than 4.5 meter bus section and contends with other signals. For example, as shown in Figs. 8A - 8C, if the data length of the packet from node 3 to node 4 is shorter than the distance between nodes 3 and 4, then node 3 will receive a "ghost" request signal from node 4, which prevents node 1 from receiving an acknowledgment signal from node 4 indicating receipt of the packet by node 4.

The cause of this problem is illustrated by the timing diagram of Fig. 9, which shows that node 3 transitions from the Idle state into a Request state because of the receipt of a Request signal from node 4 despite the fact that node 3 has transmitted a data packet to node 4. Therefore, even though node 4 receives the data packet and sends an acknowledgment signal to

node 3, node 3 ignores the acknowledgment signal because node 3 is in a Request state and is waiting for a Grant signal from node 2.

The present invention solves this problem by ensuring that the transceiver in the network maintains an Idle state for a period of time that corresponds to the turnaround time between other nodes.

The present invention provides this capability by providing a transceiver with a selector and a controller that controls the selector to supply an idle signal (instead of, for example, a decoded signal) to a higher layer for a predefined time interval which starts at the end timing of a packet transmitted from the higher layer to the transmission medium. In this manner, because of the idle signal being supplied to the higher layer for the predefined time interval, the higher layer is maintained in an Idle state for the predefined time interval.

In an exemplary, non-limiting embodiment, the predefined time interval corresponds to the turnaround time between nodes on the network. The predefined time interval may be determined during a Tree ID process as shown in Fig. 11 and stored in a counter 24 (Fig. 10). Then, during normal operation, a comparator 33 may compare the output signal from a counter 32 that counts the amount of time elapsed from an end of data signal and may then control a flip-flop 30 to ensure that a selector 29 sends an Idle signal to the higher layer.

II. THE DOUBLE PATENTING REJECTION

The Examiner alleges that claims 1-2, 6, 10, 12, 16-17 and 24 are obvious over claims 1, 4, 8-9, 11, 18, and 20 of U.S. Patent No. 6,529,977. While Applicant submits that the claims of

U.S. '977 do not teach or suggest any of the subject matter of the present application claims, to speed prosecution, Applicant encloses a terminal disclaimer to remove this rejection.

III. THE 35 U.S.C. § 112, SECOND PARAGRAPH REJECTION

The Examiner alleges that claims 21-23 are indefinite. While Applicant submits that such would be clear to one of ordinary skill in the art taking the present Application as a whole, to speed prosecution claims 21-23 have been amended in accordance with Examiner Tsegaye's very helpful suggestions.

In view of the foregoing, the Examiner is respectfully requested to withdraw this rejection.

IV. THE PRIOR ART REJECTION

Regarding the rejection of claims 14-15, the Examiner alleges that the Bastiani et al. reference teaches the claimed invention. Applicant submits, however, that there are elements of the claimed invention which are neither taught nor suggested by the Bastiani et al. reference.

The Bastiani et al. reference does not teach or suggest the features of the present invention including: 1) exchanging signals between a network node and a remote node attached to a distant end of a bus and determining therefrom a turnaround time between the nodes (claim 14); 2) setting a state machine in an idle mode for an interval beginning with an end timing of a packet transmitted from the node to the bus until the interval corresponds to the turnaround time (claim 14); 3) incrementing a count value beginning with a start timing of a child notify signal

transmitted from a node to a bus and terminating the increment of the count value at an end timing of a parent notify signal received by the node from said bus (claim 15); and 4) setting a state machine in an idle mode for an interval beginning with an end timing of a packet transmitted from the node to a bus until said interval corresponds to the incremented count value (claim 15). In this manner, the present invention is capable of determining the turnaround time between nodes and then placing the node into an idle condition for a period of time that matches the turnaround time after transmitting a packet, thereby avoiding contention between signals between nodes which are separated by a distance that is greater than 4.5 meters (page 8, lines 2-9 and page 14, lines 13-17).

In stark contrast, the Bastiani et al. reference merely discloses forcing a device to wait for a predetermined turnaround time between the time of receiving a signal and responding to the signal to ensure that the bus line has settled and to provide enough time for the other one of the slave/host to activate its receiver (col. 24, lines 19-27 and col. 42, lines 31-42).

Therefore, the “turnaround” time that is disclosed by the Bastiani et al. reference is not determined based upon an exchange of signals between nodes (items “1)” and “3)” above). Rather, the Bastiani et al. reference explains that the “turnaround time is 2 byte times to allow the line to settle and to allow the host to enable its receiver.” (Emphasis added, col. 42, lines 39-41).

Indeed, the Bastiani et al. reference does not explain how this turnaround time is determined, let alone teach or suggest that the turnaround time is based upon an exchange of signals between nodes. Rather, the Bastiani et al. reference would seem to suggest to one of ordinary skill in the art that the turnaround time may have been experimentally derived based

upon the amount of time that is required for the “line to settle and to allow the host to enable its receiver.” Thus, the “turnaround time” that is disclosed by the Bastiani et al. reference is clearly not based upon any exchange of signals between nodes as recited by claims 14 and 15.

Further, as explained above, the turnaround time of the present invention is used to place a node into an idle state after which that node has transmitted a packet. In stark contrast, the Bastiani et al. reference explains that the node waits for a predetermined turnaround time after that node has received a packet. The Bastiani et al. reference explains that “[a] slave device sensing the end of the packet and wishing to send a response must wait 20ns at a minimum before enabling the driver and starting the transmission. Similarly, the host after a packet from the slave device and wishing to send a packet to the [slave] device must wait 20 ns minimum from the end of the received packet.” (Emphasis added, col. 24, lines 21-27). Therefore, the Bastiani et al. reference does not teach or suggest setting the node into an idle state after that node has transmitted a packet as recited by claims 14 and 15.

Therefore, the Bastiani et al. reference does not teach or suggest each and every element of the claimed invention and the Examiner is respectfully requested to withdraw this rejection of claims 14-15.

V. FORMAL MATTERS AND CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully submits that claims 1-24, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to

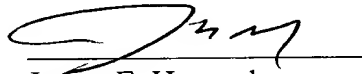
pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 8/16/04



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